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Science Resource Office
Massachusetts General Court
Room 312
State House, Boston, Ma 02133
(617) 722-1236

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"Non-Hazardous Solid Waste Disposal In Massachusetts"

Recent newspaper accounts of a "landfill crisis" in Eastern Massachusetts have people wondering how we dispose of the 6-7 million tons of solid waste generated yearly in this state.1 Landfilling is the most common method of disposal. There are 266 active landfills in Massachusetts (226 public, 40 private.)2 They basically operate the same way; compacting the solid waste in layers and then covering it with soil. An estimated 4 million tons of solid waste are landfilled annually.3

Under state regulations, hazardous waste cannot be landfilled.4 Landfills contain mostly municipal solid waste collected from households and commercial companies. The remainder is industrial and commercial solid waste that is collected and disposed of privately. Some solid waste, like industrial ash, sewerage solids (sludge), and asbestos, requires prior permission to be landfilled.5

The local board of health must first approve the site for any proposed landfill. The landfill design and operation plans are then sent to the State's Department of Environmental Quality Engineering (DEQE) for approval. Together, the local board of health and DEQE ensure that the landfill complies with Massachusetts General Law Chapter 111, Section 150 A and State Sanitary Landfill Regulations (310 CMR 19.00). According to Ms. Nessen of DEQE, the landfill design and operation plans of 30

operating landfills have not been sent to DEQE yet.

In 1971, the regulations were adopted to protect public health by minimizing water and air pollution. Open dumps were converted to sanitary landfills by prohibiting burning at landfills, preventing them from being located in wetlands or flood areas, and requiring daily covers over refuse.

The DEQE revised landfill regulations in 1981 to meet the landfill criteria of the Federal Resource Conservation and Recovery Act. These draft regulations require ground water monitoring wells, methane gas control, and linings at landfills. Groundwater pollution results when rain seeps through landfills picking up contaminates, becoming leachate. Methane gas is given off by the underground decomposition of waste in landfills. The gas burns easily and can explode when it accumulates.

Many landfills are reaching capacity. According to the Department of Environmental Management's Bureau of Solid Waste Disposal, around 150 of today's landfills will be filled to capacity within 5 years, leaving the state with a diminished capacity for disposal of the waste. To avoid such a situation the volume of solid waste that is landfilled must be reduced. Volume reduction can be achieved by recycling some of the waste and burning the rest. Experts say that 30% of the waste can be recycled and that 20% of the remaining solid waste which is burned remains as ash that must be landfilled.

Refuse burning takes place at four facilities in Massachusetts. Fall River and Framingham, have municipal incinerators while Saugus and Pittsfield, have privately owned waste-to-energy plants (often called resource recovery facilities). Operations

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at these facilities are similar except that the municipal incinerators do not recover the energy produced. Unprepared municipal solid waste is mass-burned at the Refuse Energy Systems Company (RESCO) plant in Saugus and the Vicon plant in Pittsfield. Refuse trucks dump municipal solid waste into large storage pits at the facilities. Cranes then keep furnace hoppers continually fed. As the refuse drops down a chute, it enters a boiler. Here, the refuse combusts with hot air and radiates heat against the furnace walls. Water, inside metal pipes along the furnace walls, begins to boil and generate steam. The steam is then sold by the plant to nearby industries. Ash from the combustion process moves on a grate to a water filled tank where it is quenched before being landfilled.

The Resco plant is larger than the Vicon plant. Resco uses two 750 tons of refuse per day (TPD) boilers to produce 370,000 pounds of steam per hour. It sells steam to the General Electric Company, but plans to add a steam turbine so it can also sell electricity to the New England Power Company. Vicon uses two of three 120 TPD boilers to produce 35,000 pounds of steam per hour. It sells steam to the Crane Paper Company.

A different type of waste-to-energy plant is under construction in Lawrence, Massachusetts. This plant will burn refuse derived fuel (RDF) which will be prepared at a facility in Haverhill, Massachusetts. Approximately 1200 TPD of municipal solid waste will be shredded into RDF and then burned to produce electricity for sale to the New England Power Company. Another privately owned plant is also under construction in North Andover, Mass and is scheduled to operate in 1986. The plant will burn unprepared municipal solid waste from cities and towns in the Northeast

Solid Waste Council (NESWC) and will sell electricity to the New England Power Company.

Other regional councils and the city of Boston plan to have waste-to-energy plants built for their use in Springfield, Boston, Holyoke, Rochester, Plainville and Worcester. Most will be mass-burning plants producing electricity.

Because of their large size, most waste-to-energy plants require the waste from many communities to operate efficiently. To ensure an adequate waste supply, the Department of Environmental Mangement's Bureau of Solid Waste Disposal has helped cities and towns join regional councils and commit their municipal solid waste to the facilities.

Current recycling programs in Massachusetts consist of minor separation at landfills, collection drives and public participation projects. According to Ms. Marley, the Recycling Program Director at the Department of Environmental Management's Bureau of Solid Waste, these programs are inadequate and need improvement. Recycling programs are affected by the depressed market conditions for recyclable materials. Ms. Marley suggests giving tax incentives to people who purchase recycled goods to increase the demand for recyclable materials and encourage recycling.

The ideal route for solid waste disposal would combine recycling, incineration resource recovery, and landfills. Ms. Gardner of the Department of Environmental Management's Bureau of Solid Waste Disposal, says that for optimum waste disposal, "first everything in the waste stream that could be recycled should be separated. Then, the waste remaining after separation should be burned at the waste-to-energy plants. Only the ash and anything that could not burn would be landfilled."

Eric Hansen
Science Resource Office
August 14, 1984

Footnotes

1 The Commonwealth of Massachusetts Department of Environmental Quality Engineering. Regulations For The Disposal of Solid Waste By Sanitary Landfill, Public Discussion Draft. p. 1

2 The Commonwealth of Massachusetts Department of Environmental Quality Engineering Division of Hazardous Waste. "Inventory of Active and Inactive Solid Waste Landfills."

3 The Commonwealth of Massachusetts Department of Environmental Management Bureau of Solid Waste Disposal. "Massachusetts Solid Waste Management Summary Sheet." p. 35

4 The Commonwealth of Massachusetts Department of Environmental Quality Engineering. Hazardous Waste Regulations, (310 CMR 30.631: Wastes Unacceptable for Landfilling.)

5 The Commonwealth of Massachusetts Department of Environmental Quality Engineering Regulations For The Disposal of Solid Waste, (310 CMR 19.16: Special Waste.)